ATS Framework Working Group

Overview and Status

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Agenda

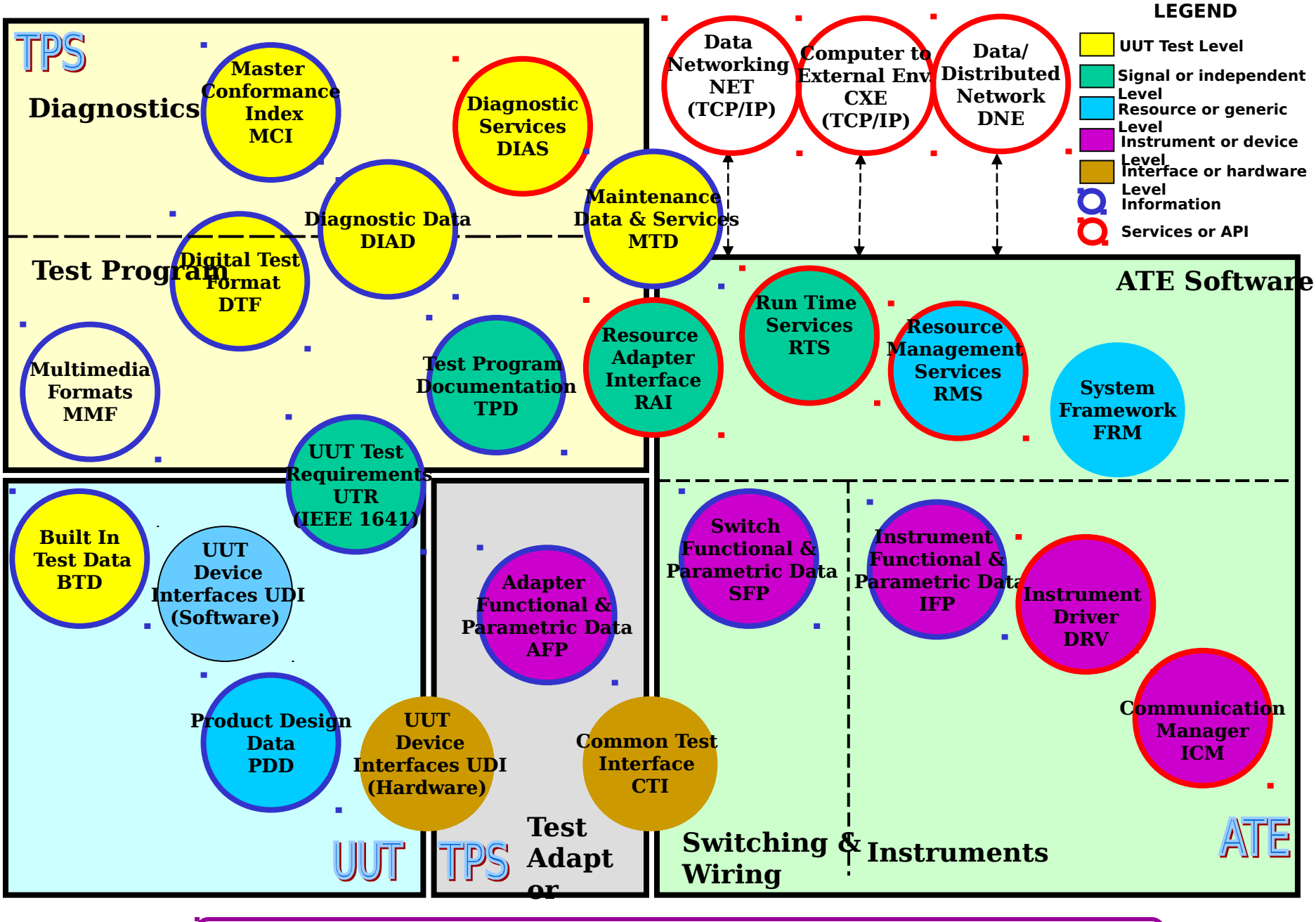
- **FY06 Schedule**
- **Diagrams**
- **Framework Effort Status**
- **SBIR Status**
- **Other Working Group Status**
- **AMB Support**
- **O-level Tester Support**
- **AUTOTESTCON**

Priority Key Elements

- Team members are assigned to each element and working with respective working groups to satisfy these elements
  - 9 interface elements are being focused on
    - AFP, IFP, SFP, RAI, DIAD, DIAS, RTS, MTD, MCI
      - ATML, DISR, LXI, SCC20, and Synthetic Instruments are also being focused on through the elements above
  - An accomplishments file is being sent periodically
  - A schedule marking the percentage of completion for each of the elements above has been created

FY06 Schedule

See Framework Development Schedule



DoD ATS Technical Framework Relationships

DRV Standards and Status

- **IVI Standards**
  - IVI-4.1 IviScope Class Specification
  - IVI-4.2 IviDMM Class Specification
  - IVI-4.3 IviFGen Class Specification
  - IVI-4.4 IviDCPwr Class Specification
  - IVI-4.6 IviSwitch Class Specification
  - IVI-4.7 IviPwrMeter Class Specification
  - IVI-4.8 IviSpecAn Class Specification
  - IVI-4.10 IviRFSigGen Class Specification
  - IVI-3.10 Measurement and Stimulus Subsystem (IVI-MSS)
  - IVI-3.12 IviSig Class Specification
  - VPP-3.1 Instrument Driver Archtitecture and Design Specification
  - VPP-3.2 r5 Instrument Driver Functional Body Specification
  - VPP-3.3 r4.01 Instrument Driver Interacvtive Developer Interface Specification
  - VPP-3.4 r2.3 Instrument Driver Programmatic Developer Interface Specification

- **DISR Status**
  - Emerging
  - Emerging
  - Emerging
  - Emerging
  - Emerging
  - Emerging
  - None
  - None
  - Emerging
  - Mandated
  - Emerging
  - Emerging

- **Mandated**

Return

DIAS Standards and Status

- **DIAS Standards**
  - **IEEE 1232**
- **DISR Status**
  - **Emerging**
- **Working to Complete Standards**

Return

DIAD Standards and Status

- **DIAD Standards**
  - **IEEE 1232**
- **DISR Status**
  - **Emerging**
- **Working to Complete Standards**

Return

CTI Standards and Status

- **CTI Standards**
  - **IEEE P1505**
  - **IEEE 1552:1999**

- **DISR Status**
  - **Emerging**
  - **Emerging**

- **Near Completion**

Return

FRM Standards and Status

- **FRM Standards**
  - **VPP-2 r4.2**
  - **IVI 3.10**
- **DISR Status**
  - **Mandated**
  - **None**

- **Mandated**

Return

ICM Standards and Status

- **ICM Standards**
  - **VPP 4.3 r2.2**
- **DISR Status**
  - **Mandated**
- **Mandated**

Return

BTD Standards and Status

- **BTD Standards**
  - **IEEE 1149.1:2002**
  - **IEEE 1149.4**
  - **IEEE1149.5**
  - **IEEE P1552:1999**

- **DISR Status**
  - **Emerging**
  - **Emerging**
  - **Emerging**
  - **Emerging**

- **Not Started**

Return

PDD Standards and Status

- **PDD Standards**
  - **ANSI/EIA 682**
  - **ATML UUT Description**
- **DISR Status**
  - **Emerging**
  - **None**
- **Not started**

Return

AFP,SFP,IFP Standards and Status

- **AFP Standards**
  - IEEE1641
  - ATML Test Adapter
- **IFP Standards**
  - ATML Instrument Description
  - ATML Test Station
- **SFP Standards**
  - ATML Instrument Description
  - ATML Test Station

- **DISR Status**
  - None
  - None
  - None
  - None
  - None
  - None

- **Working to Complete Standards**

Return

MTD Standards and Status

- **MTD Standards**
  - **IEEE P1636**
  - **IEEE 1545**
- **DISR Status**
  - **None**
  - **Emerging**
- **Working to Complete Standards**

Return

DTF Standards and Status

- **DTF Standards**
  - **IEEE 1445**
- **DISR Status**
  - **Mandated**
- **Mandated**

Return

MMF Standards and Status

- **MMF Standards**
  - **Misc. Standards exist in DISR outside our Domain which are inherited into our domain**
- **DISR Status**
  - **Mandated**
- **Not Started**

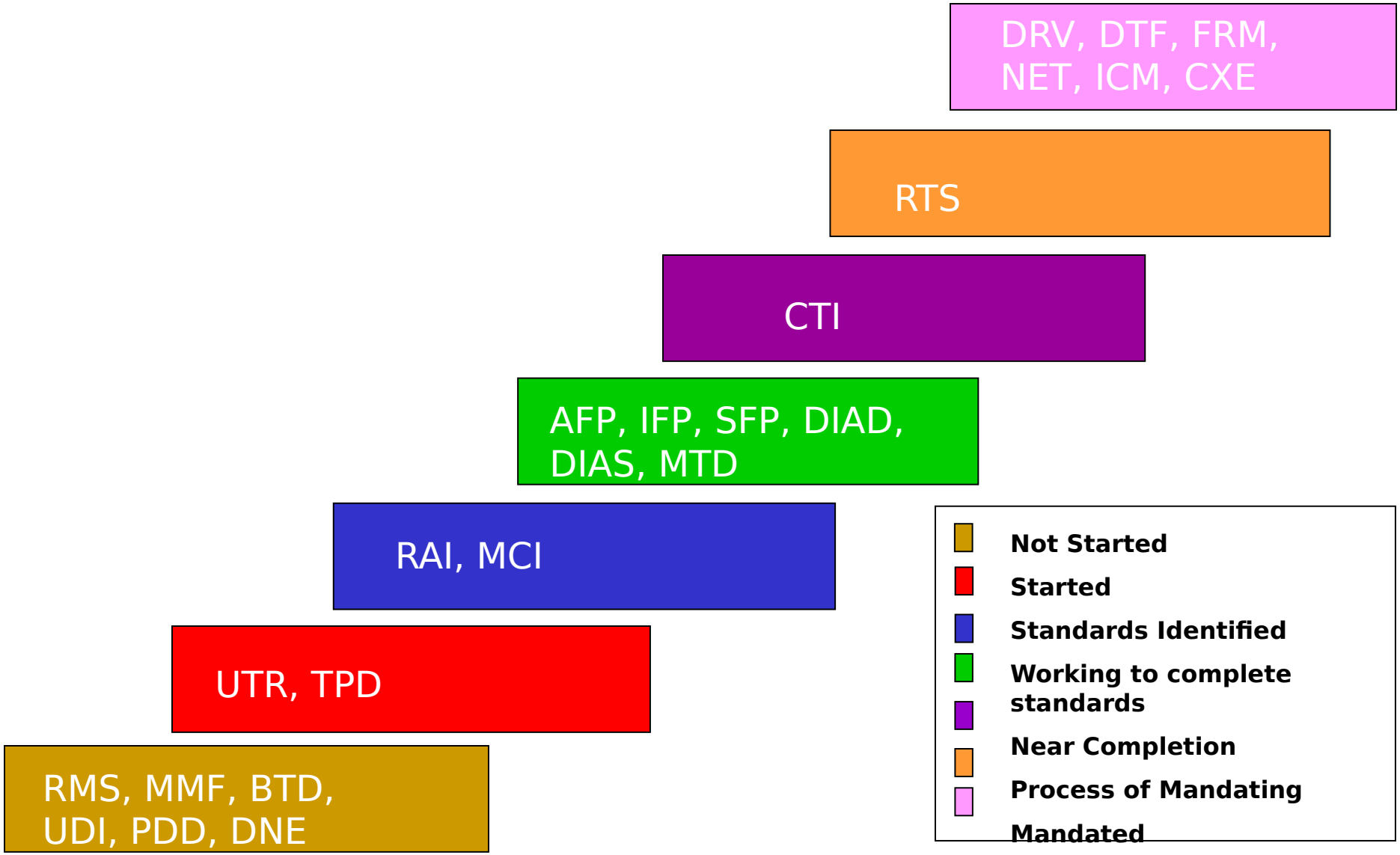
Return

RAI Standards and Status

- **RAI Standards**
  - **Possibility of IEEE 1641**
- **DISR Status**
  - **None**
- **Standards Identified**

Return

Element Progress Ladder



FY06 Effort Status

AFP, IFP, & SFP

Major Tasks Accomplished

- **Removed the SWM element from Framework**
- **Identified standards required**

Impact to the Framework

- **LXI, IVI signal drivers, and SIWG technologies may have an affect on the Framework**
- **Test Station Connectivity (TSC) may be added as a new element to cover wiring; considering RAI use cases and CTI to ensure that SFP/TSC is necessary**

Team Members

Ken Fox; 300 hours
Joe Stanco; 300 hours

Cont

FY06 Effort Status (Cont.)

RAI

Major Tasks Accomplished

- 30 industry participants
- RAI definition complete
  - RAI is the software interface that lies between test programs and instrument access layers which enforces platform independence. The interface is meant to provide a conduit for test instrument related information only. Other ATE assets such as monitors, printers, and others are not within the scope of RAI.
- Terminology definitions near completion
- Presentation to 1641 WG to incorporate will be given during next SCC20 meeting
- Expect RAI to be part of 1641 WG by June

Impact to the Framework

- RAI is central to Framework goal of test program transportability and instrument interchangeability

Team Members

Hugh Pritchett; 486 hours

Jennifer Fetherman; 430 hours

Cont

FY06 Effort Status (Cont.)

DIAD/DIAS

Major Tasks Accomplished

- PAR approval for 1232-2002 AI-ESTATE (for major revision)
- Incorporation of diagnostic models and services into XML using SMART TPS and ARGCS have identified areas that need improvement
- XML services for Test Results in SIMICA P1636.1
- Ongoing SIMICA, MAF, and O-level data efforts helped to identify gaps in DIAD/DIAS

Impact to the Framework

- Several additional standards would be required to support DIAD, especially in the area of manufacturing/performance, O-level maintenance/closed loop maintenance and prognostics
- Application of DIAS will go across all maintenance phases

Team Members

Mukund Modi; 200 hours
Patrick Kalgren; 200 hours + SBIR funding

Cont

FY06 Effort Status (Cont.)

ATML

Major Tasks Accomplished

- Test Results schema achieved candidate status
- Instrument Description, UUT Description, Test Station & Test Adapter draft schemas
- AI-ESTATE schemas in second draft

Impact to the Framework

- ATML will provide the Framework's backbone for data interfacing

Team Members

Chris Gorringe; 500 hours

Joe Stanco; 500 hours

Jennifer Fetherman; 250 hours

Mukund Modi; 200 hours

Ron Taylor; 186 hours

Bob Fox; 170 hours

Cont

FY06 Effort Status (Cont.)

DISR

Major Tasks Accomplished

- Discussing whether IVI standards and bus standards should be included in the DISR
- Discussed impact of SI and LXI technologies and whether they should be included in the DISR
- Participated in quarterly review process of the ITSC committee of DISR

Impact to the Framework

- Consistency will be maintained between the ATS Framework and DISR
- The Framework will be documented in the DISR

Team Members

Cont

FY06 Effort Status (Cont.)

SCC20

Major Tasks Accomplished

- Provided support for completion of 1641 and User Guide 1641.1 for ballot
- 1671 Framework document being balloted
- PARS submitted for Instrument 1671.1, Test Description 1671.2, and UUT Description 1671.3

Impact to the Framework

- Signal Modeling and ATML affect several elements in the Framework

Team Members

Joe Stanco; 360 hours
Mukund Modi; 170 hours
Chris Gorringe; 160 hours
Pat Kalgren; SBIR funded

Cont

FY06 Effort Status (Cont.)

RTS

Major Tasks Accomplished

- **Developed definitions for ATML Run Time Services**
- **Updated the RTS definition**

Impact to the Framework

- **Will follow the process from the Framework Definition Procedures Guide to mandate this element**

Team Members

Chris Gorringe; 60 hours

Cont

FY06 Effort Status (Cont.)

Synthetic Instruments

Major Tasks Accomplished

- Itemized set of IVI drivers that need to be built
- Requirements document, measurement requirements, and measurement software architecture completed
- Reviewed requirements for Services and ARGCS
- Formed Systems Group to address industry needs

Impact to the Framework

- Determining where the specification will fit in the Framework

Team Members

Ken Fox; 351 hours
Chris Gorringe; 140 hours

Cont

FY06 Effort Status (Cont.)

LXI

Major Tasks Accomplished

- Cross referenced specifications contained in LXI standard with Framework objectives
- Discussed how LXI could be represented in the Framework

Impact to the Framework

- Specification may be represented in Framework

Team Members

Ken Fox; 200 hours

Cont

FY06 Effort Status (Cont.)

MTD

Major Tasks Accomplished

- **Submitted Maintenance Action Information (MAI) PAR 1636.2 to SCC20/DMC for review**
- **Submitted MAI data requirements document to SCC20/DMC**
- **PAR approved for SIMICA P1636**

Impact to the Framework

- **The SIMICA standard will support the MTD key element**
- **ARGCS and ATML are looking into standardized formats for maintenance and test data**

Team Members

Joe Stanco: 392 hours

Cont

FY06 Effort Status (Cont.)

MCI

Major Tasks Accomplished

- Provided inputs to the ATML WG on how the schema accommodates TPS/ATE requirements
- Standards identified

Impact to the Framework

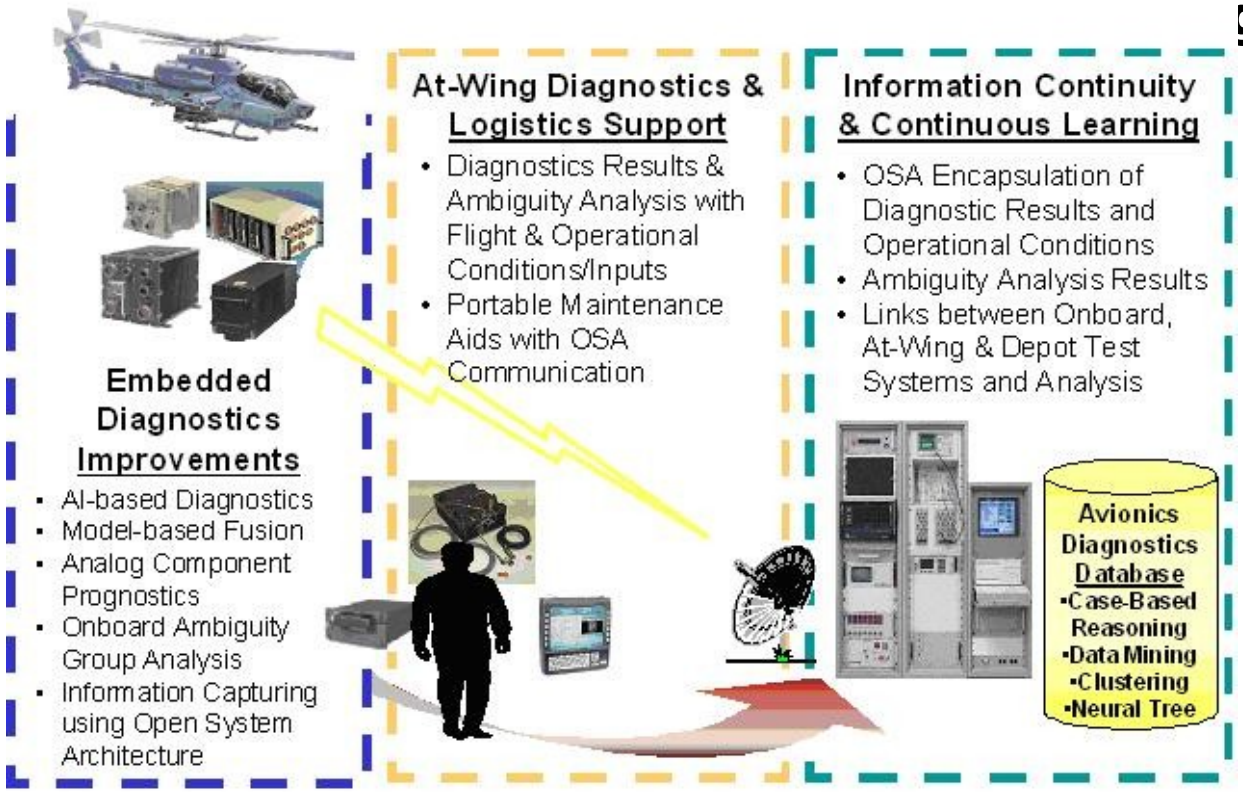
- ATML Test Configuration effort will address the MCI requirements

Team Members

Joe Stanco; 392 hours

SBIRs

- **Embedded Diagnostics / Integrated Diagnostics**
  - **Looking to incorporate into ARGCS, ATML, and SMART TPS**
  - **Leveraging for ATS Framework**
  - **Navy SBIR office will provide matching funding for gies to increase**



Cont

SBIRs (Cont.)

- **ATS Framework Support**
  - **ATML working group participation**
  - **active SCC-20 – DMC participation**
  - **AI-ESTATE Standard Revision**
    - **Committee chair**
    - **ATML Schema feedback**
    - **Services use case and implementation**
  - **MIMOSA/OSA-CBM participating member**
  - **Multiple leveraged development programs for open standards development**

Cont

SBIRs (Cont.)

- **Air Force Automatic Test Markup Language (ATML)**
  - **Navy SBIR office providing matching funding for Vektrex / TYX to accomplish the following tasks:**
    - Development of a TestDescription to ATLAS converter
    - Incorporation of the Instrument schema in the TYX PAWS Device database and processing of the document at signal allocation
    - Incorporation of the TestResults schema in the PAWS RTS Data Logger

Status of Other Working Groups

- **IVI**

The IVI Foundation is chartered with defining software standards for instrument interchangeability. IVI is defining a standard instrument driver model that enables the replacement of instruments without requiring software changes.

Recent Accomplishments (class drivers):

- **An on-line list of over 100 IVI drivers is available for download from various vendors**
- **In balloting process for the LXI trigger and synchronization API**

Continuing Efforts:

- **Counting/Timer class specification**
- **Digital Class specification**
- **Signal Interface specification**
- **LXI Trigger and Synchronization**
- **.net specification**

Cont

Status of Other Working Groups
(Cont.)

- **Machinery Information Management Open Standards Association (MIMOSA)**

  MIMOSA develops standards for exchange and warehousing of equipment asset monitoring data. The OSA-CBM (Condition-Based Maintenance) data standard (XML) can represent BIT and Bus Monitor data and provide diagnostic results.

  Recent Accomplishments:
  - **Released version 3.0 of OSA-CBM Data Model**

  Continuing Efforts
  - **Evaluating condition monitoring elements for utility in the O-level and diagnostic data realm**
  - **Determining value of OSA-EAI (Enterprise Application Integration) Standard in the services realm**

AMB Support

- **Army Synthetic Instruments (SI) funding**
  - **Provided FY05 funding to enhance the Framework Working Group's participation in the SI Working Group**
- **Navy Overall Framework funding**
  - **FY06 funding is similar to FY05**
  - **Additional funding for SCC20 support**
- **Additional funding would be beneficial to advance the completion of the Framework tasks**

Cont

AMB Support (Cont.)

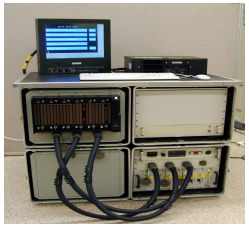
- **Additional Funding Utilization**
  - **MAI data**
  - **Support for new effort (Test 1641 Signal Based measurement enhancements)**
  - **O-level support and reasoner feedback loop**
  - **Condition monitoring and prognostics (for closed-loop diagnostics and verification of prognostic capabilities)**
  - **Synthetic instruments (relation to reasoning elements that can best configure test and stimulation to duplicate conditions that caused the fault and intermediate collectors of measurement data, can provide substantial benefit to the closed-loop diagnostic arena)**
  - **AFP, IFP, SFP (resource component of ATML schemas)**
  - **TPS perspective in ATML and Framework**
  - **Travel (ATML, SI, SCC20 meetings)**

O-Level Tester Framework

- **The Framework Working Group created a paper analyzing this issue (see paper)**
- **JOLATS charter includes incorporation of the Framework**
- **Support could be provided through Framework Working Group**

AUTOTESTCON Events

Automated Test Equipment



- **Plenary**
  - **Framework will be discussed, how it relates to ARGCS and eCASS**
  - **A Framework tutorial will be presented**

- **Framework Session**
  - **Signal Modeling (Chris)**
  - **DoD / MOD Integration of Open Standards (Chris)**
  - **RAI (Hugh)**
  - **Reasoner Data Management (Patrick)**
  - **Matrix (Mike, Jennifer, Joe, & Mukund)**
  - **Tutorial (Mike, Jennifer, & Ken)**
  - **Systems Engineering Approach (Luis)**
  - **SMART TPS w/MATLAB as a Diagnostic Reasoner (Tom)**

FWG Open Systems Evaluation

- Marty asked the Framework Working Group to determine how many elements need to be incorporated in an ATS for it to be considered open
- The Framework Working Group created a paper analyzing this issue (see paper)
- A matrix was created to support the process of evaluating ATS as defined in the paper (see matrix)
- The matrix could be used in three ways:
  - To compare the openness of one ATS versus another
  - To Determine which elements should be incorporated into a new ATS
    - The Framework Working Group will also use the matrix to prioritize the Framework efforts
  - To Determine how well an ATS meets a particular attribute
- This could be used for future ATS acquisitions (ARGCS, eCASS, etc.)
- The paper and matrix are currently under review